

An Assessment of Cheyenne River Sioux Tribe Reservation Watershed Impaired by Nonpoint Source Pollution

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The Cheyenne River Sioux Tribe (CRST) Reservation is located in West Central South Dakota, encompassing approximately 2.7 million acres. There are approximately 58 streams that traverse or pass through the tribal land. The identified beneficial uses of the reservation's water included domestic water supply, fish and aquatic life propagation, full-immersion recreation, wildlife propagation, stock waters, irrigation and agriculture supply, and tribal cultural and spiritual activities. Approximately 560 of 1,720 miles of streams on the reservation were assessed for impairment from nonpoint source (NPS) pollution. Nine of 58 streams (15.5%) were evaluated and were found to exhibit moderate or severe impairment. Approximately 210 miles (37.5%) of the assessed streams were considered severely impaired, and 350 miles (62.5%) were moderately impaired. The primary causes for impairment included nutrients (e.g., nitrogen, phosphorus), total dissolved solids, sediment, metals, pesticides, and fecal coliform bacteria. Assessment techniques were based on data collected from water quality monitoring, predictive modeling, fishery and benthic surveys, citizen complaints, professional judgment, and ambient data. NPS pollutants are believed to represent the most widespread and threatening pollution factors to the reservation's water resources. The primary NPS resulting in impairment are identified as agricultural runoff, stream bank erosion, mining activities, and land disposal action. Other sources include sewer runoff, construction activities, and hydro-modifications. U.S. Environmental Protection Agency (U.S. EPA) Region 8 is collaborating with the CRST and Natural Resource Conservation Service, to reduce, eliminate, and control problems associated with NPS pollution by implementing the vegetation filter strips best management practices (BMPs) under Section 319 NPS of the Clean Water Act. Sixteen watersheds with different agricultural/grazing practices can be restored after replanting foliage at the higher elevation of each watershed. A study to evaluate the effectiveness of BMPs for NPS pollution is underway. The study will identify pollution, particularly severe stream bank erosion problems from agricultural and hydro-modification activities, beneficial uses, causes of impairment, degree of impacts, and specific sources of NPS pollution for specific surface water bodies. An analysis of NPS water quality problems on the reservation will be discussed.